CLAIMS:

1. A method for displaying a three-dimensional stereo image comprising the steps of:

displaying a left-eye image defined by a plurality of left-eye strip pixels and a right-eye image defined by a plurality of right-eye strip pixels such that the left-eye pixels and the right-eye pixels are arranged alternately from the left to the right in a width direction;

guiding the left-eye image and the right-eye image separately to the left eye and the right eye, respectively, of an observer;

shifting the left-eye image and the right-eye image by one pixel in an oscillating manner; and

deflecting the left-eye image and the right-eye image synchronized with the one-pixel shifting operation.

2. A three-dimensional image display apparatus comprising:

an image display device configured to display a left-eye image defined by a plurality of left-eye

strip pixels and a right-eye image defined by a plurality of right-eye strip pixels such that the left-eye pixels and the right-eye pixels are arranged alternately from the left to the right in a width direction;

an image separator positioned in front of the image display device and configured to guide the left-eye image and the right-eye image to the left eye and the right eye, respectively, of an observer separately;

an image shifter configured to shift the left-eye image and the right-eye image by one pixel in an oscillating manner; and

a light deflector configured to deflect the left-eye image and the right-eye image having passed through the image separator synchronized with the one-pixel shifting operation of the image shifter.

3. The three-dimensional image display apparatus of claim 2, wherein the light deflector includes a deflecting device and a voltage source for applying a voltage to the deflecting device, the deflecting device comprising:

a pair of transparent substrates facing each

other;

a chiral smectic C phase liquid crystal layer held between the transparent substrates;

a vertical aligning film formed on an inner surface of at least one of the transparent substrates; and

a plurality of electrodes configured to apply an electric field to the liquid crystal layer parallel to the transparent substrates.

4. The three-dimensional image display apparatus of claim 2, wherein the light deflector includes a deflecting device and a voltage source for applying a voltage to the deflecting device, the deflecting device comprising:

a pair of transparent substrates facing each other;

a nematic liquid crystal layer held between the transparent substrates;

an aligning film formed on an inner surface of at least one of the transparent substrates; and

a pair of electrodes formed one on each of the transparent substrates, at least one of the electrodes being an interlaced comb electrode, and

the voltage being applied across the electrodes such that the intensity of an electric field varies between adjacent comb teeth of the interlaced comb electrode.

5. The three-dimensional image display apparatus of claim 2, wherein the light deflector includes a deflecting device and a voltage source for applying a voltage to the deflecting device, the deflecting device comprising:

a pair of transparent substrates facing each other, at least one of the substrates having an inner surface with a saw-tooth profile with a slope corresponding to a direction of optical deflection;

a liquid crystal layer held between the transparent substrates, the liquid crystal being in one of a nematic phase and a chiral smectic C phase;

an aligning film formed on the inner surfaces of the transparent substrates; and

a plurality of electrodes configured to apply the voltage to the liquid crystal layer.

6. The three-dimensional image display apparatus of

claim 5, wherein a period of the saw-tooth profile corresponds to a period of the image separator.

7. The three-dimensional image display apparatus of claim 2, wherein the light deflector includes a deflecting device and a voltage source for applying a voltage to the deflecting device, the deflecting device comprising:

a pair of transparent substrates facing each other;

a nematic liquid crystal layer held between the transparent substrates;

an aligning film formed on an inner surface of at least one of the transparent substrates; and

a plurality of electrodes formed at least one on each of the substrates to apply the voltage to the liquid crystal layer, the electrode formed on at least one of the substrates being comprised of a plurality of strip electrodes connected by a high-resistance resistive element.

8. The three-dimensional image display apparatus of claim 2, wherein the image separator is a lenticular

lens array comprising a plurality of lenticular lens elements arranged from the left to the right.

9. The three-dimensional image display apparatus of claim 2, wherein a frame of each of the left-eye image and the right-eye image is divided in two, and a half frame of the left-eye image and a half frame of the right-eye image are shifted by one pixel.

10. The three-dimensional image display apparatus of claim 2, wherein the image display device is a direct-view liquid crystal display panel.

11. A method for displaying a three-dimensional stereo image comprising the steps of:

generating a plurality of input images corresponding to multiple viewpoints;

displaying the input images on an image display device in a time-dividing manner;

separating a light image from the image display device into a left-eye image and a right-eye image using an image separator positioned on a viewpoint

side of the image display device; and

deflecting light paths of the left-eye image and the right-eye image emitted from the image separator toward said multiple viewpoints.

12. A three-dimensional image display apparatus comprising:

an image display device positioned at a prescribed distance from multiple viewpoints;

an image separator positioned on a viewpoint side of the image display device; and

a light deflector configured to deflect a light image having passed through the image separator so as to guide the light image to the multiple viewpoints, wherein the image display device receives a plurality of input images generated corresponding to the multiple viewpoints, and displays the input images in a spatially time-dividing manner by spatially dividing the input image by L and time-dividing the input image by m, wherein m and L are natural numbers greater than or equal to 2.

13. The three-dimensional image display apparatus of

claim 12, wherein the image display device has a display area divided into a plurality of sub regions, each sub region having a width d, and the image separator is designed such that at least one of a shape, an index of refraction, and a transmissivity changes periodically at a pitch Ds defined by a product of L and d (Ds=L*d).

14. The three-dimensional image display apparatus of claim 12, wherein the number of directions of optical deflection caused by the light deflector is m.

15. The three-dimensional image display apparatus of claim 12, wherein if the number of input images is n, then n is a product of L and m (n=L*m).

16. The three-dimensional image display apparatus of claim 12, wherein a deflection switching timing of the light deflector is synchronized with an image rewriting timing of the image display device.

17. The three-dimensional image display apparatus of claim 12, wherein a fast scan direction of the image display device is a vertical direction.

18. The three-dimensional image display apparatus of claim 12, wherein the image is rewritten collectively at all pixels of the image display device.

19. The three-dimensional image display apparatus of claim 12, wherein the light deflector comprises:

a pair of substrates, an inner surface of at least one of the substrates having a sloped portion corresponding to a direction of optical deflection;

a liquid crystal layer in one of a smectic C phase and a nematic phase held between the substrates; and

a pair of electrodes configured to apply a voltage to the liquid crystal layer.

20. The three-dimensional image display apparatus of claim 19, wherein the sloped portion is in a saw-tooth profile of the inner surface of the substrate.

21. The three-dimensional image display apparatus of claim 12, wherein the light deflector includes a reference deflecting device and one or more deflecting devices added to the reference deflecting device, and an angle of deflection $\theta j$ of the j-th deflecting device added to the reference deflecting device is expressed as

$$\theta j=\theta 0*(1/2)^{j} \quad (j=1,\ 2,\ \ldots,\ k)$$

where $\theta 0$ is an angle of deflection of the reference deflecting device, and k is the number of added deflecting devices.

22. The three-dimensional image display apparatus of claim 12, wherein the image display device is a direct-view liquid crystal display panel.

23. The three-dimensional image display apparatus of claim 12, wherein the image display device is a direct-view liquid crystal display panel having liquid crystal on silicon.

24. The three-dimensional image display apparatus of claim 12, wherein the image display device is a projection-type liquid crystal display device having an aperture controlling part in a light bulb in order to restrict the size of a projected pixel at or under a pixel pitch.

25. The three-dimensional image display apparatus of claim 24, wherein the aperture controlling part is a microlens provided for each pixel.

26. The three-dimensional image display apparatus of claim 12, wherein the image separator is a lenticular lens array.

27. The three-dimensional image display apparatus of claim 19, wherein each of the substrates of the deflecting device has an inner surface with a saw-tooth profile having the sloped portion corresponding to the direction of optical deflection, the sloped portions of the substrates being symmetric with

respect to the liquid crystal layer, and an index of refraction of one of the substrates is equal to an index of refraction for an ordinary ray in the liquid crystal layer, while an index of refraction of the other substrate is equal to an index of refraction for an extraordinary ray in the liquid crystal layer.